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REMARKS

The application has been reviewed in light of the final Office Action dated November 3, 2005. Claims 7-21 were pending in the application, with claims 7-11 and 13-15 having been withdrawn by the Patent Office from further consideration. Claims 1-6 were previously canceled, without prejudice or disclaimer. By this Amendment, claims 7-11 and 13-15 have been canceled without disclaimer or prejudice to Applicant's right to pursue the claims in one or more divisional applications, new dependent claims 22 and 23 have been added, and claims 12 and 16-21 have been amended to clarify the claimed invention. Accordingly, claims 12 and 16-23 are pending upon entry of this Amendment, with claims 12 and 16 being in independent form.

Claims 12 and 16-21 were rejected under 35 U.S.C. §112, second paragraph as purportedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

By this Amendment, claims 12 and 16-21 have been amended to clarify the claimed invention.

Withdrawal of the rejection under 35 U.S.C. §112 is requested.

Claims 12, 16 and 18-21 were rejected under 35 U.S.C. §102(b) as purportedly anticipated by U.S. Patent 4,920,007 to Sawamura et al. Claims 12 and 16-21 were rejected under 35 U.S.C. §102(b) as purportedly anticipated by U.S. Patent No. 4,902,584 to Uchiyama et al. Claims 12, 16 and 18-21 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 5,156,693 to Ide et al. in view of Sawamura. Claims 12 and 16-21 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Ide in view of Uchiyama.

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 12 and 16 are patentable over the cited art, for at least the following reasons.

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This application is directed to an improved phase variation type data recording medium having an improved heat-resistant protective layer. The phase variation type data recording medium includes additionally a reflective layer and a phase variation type recording layer substantially constituted by Ag, In, Sb and Te. The heat-resistant protective layer comprises silicon oxide as a basic material and a compound comprising silicon nitride. The compound has a high thermal conductivity (that is, greater than or equal to 10 W/m.deg) which allows data to be recorded stably and reliably to, and erased from, the phase variation type data recording medium a number of times repeatedly. The thermal conductivity of the protection layer allows amorphous portions to be recorded in the phase variation type recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions. That is, other than in the recorded portions, the recording layer is protected from the effects of heat in order to preserve the boundary between the recorded portions and unrecorded portions and avoid crystallization and erasure of the recorded portions. Thus, desirable overwrite characteristics of a phase variation type data recording medium can be attained. Each of independent claims 12 and 16 includes these features of the claimed invention.

Sawamura, as understood by Applicant, is directed to a magneto-optical recording medium including a GdTbFe (or GdTbFeCo) magnetic recording layer and a protective layer for improving the durability and corrosion resistance of the magnetic recording layer.

Sawamura does not disclose or suggest, however, a phase variation type data recording medium including a reflective layer, a phase variation type recording layer substantially constituted by Ag, In, Sb and Te, and a protection layer which comprises SiO₂ as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, wherein the thermal conductivity of the protection layer allows

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amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions, as provided by amended claim 12.

Applicant simply does not find teaching or suggestion in Sawamura of using along with a phase variation type recording layer substantially constituted by Ag, In, Sb and Te, a protection layer which comprises SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, wherein the thermal conductivity property of the protection layer allows amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions, as provided by amended claim 12. Therefore, Sawamura, alone or in combination with the other cited references, does not render the claimed invention of the present application unpatentable.

Uchiyama, as understood by Applicant, is directed to a magneto-optical recording medium comprising a substrate, a magnetic recording layer and a protective layer. Uchiyama proposes use of a magnetic recording layer formed from alloys containing rare earth elements and transition metals, such as TbFeCo, GdFeCo, GdTbFeCo, etc. Uchiyama, like Sawamura, proposes use of a protective layer comprising a combination of silicon oxide and silicon nitride in order to enhance (i) corrosion resistance of the recording layer and (ii) adhesion of the recording layer to a substrate.

While Uchiyama proposes that the recording layer may include other materials (such as phase conversion type materials), Applicant simply does not find a disclosure or suggestion in Uchiyama of a phase variation type data recording medium including a reflective layer, a phase variation type recording layer substantially constituted by Ag, In, Sb and Te, and a protection

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layer which comprises SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, wherein the thermal conductivity of the protection layer allows amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions, as provided by amended claim 12.

Ide et al., as understood by Applicant, is directed to an optical information recording medium. Ide proposes a laundry list of materials which may be used in a heat-resistance protective layer. Although Ide mentions that a mixture of the materials can be used, no guidance is provided for doing so.

As acknowledged in the Office Action, Ide does not disclose or suggest a protection layer comprising SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, and the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, as provided by the claimed invention of claim 12.

Each of Uchiyama and Sawamura proposes use of a protective layer comprising a combination of silicon oxide and silicon nitride in order to enhance corrosion resistance of the recording layer. As pointed out above, Sawamura and Uchiyama are not concerned with the thermal effects within the recording media during recording, erasing and overwriting. Neither Sawamura nor Uchiyama teaches or suggest that a protection layer comprising SiO_2 as a basic material, and a compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, has a desirable thermal conductivity property which allows amorphous portions to be recorded in the recording layer through heating followed by rapid

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cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions. Therefore, one skilled in the art would not have looked to modify the optical information recording medium of Ide according to the teachings of Sawamura and Uchiyama regarding the constitution of a heat-resistance protective layer.

Applicant simply does not find a disclosure or suggestion in the cited art of a protection layer for a phase variation type data recording medium including a phase variation type recording layer substantially constituted by Ag, In, Sb and Te, wherein the protection layer comprises SiO_2 as a basic material, and a compound having a thermal conductivity greater than or equal to 10 W/m.deg when in a bulk state, the compound comprising silicon nitride in a molar ratio with the basic material of 10% to 85% silicon nitride, and the thermal conductivity of the protection layer allows amorphous portions to be recorded in the recording layer through heating followed by rapid cooling, while protecting other portions of the recording layer from heating during the recording to the amorphous portions, as provided by the claimed invention of claim 12.

Independent claim 16 is patentably distinct from the cited art for at least similar reasons.

Accordingly, for at least the above-stated reasons, Applicant respectfully submits that independent claims 12 and 16, and the claims depending therefrom, are patentable over the cited art.

In view of the amendments to the claims and remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.


If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Office is hereby authorized to charge any fees that are required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

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If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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